

Claims

1. An isolated protein that has toxin activity against a lepidopteran pest, wherein said protein comprises an amino acid sequence selected from the group consisting of SEQ ID NO:17 and SEQ ID NO:19.
2. An isolated polynucleotide that encodes a protein that has toxin activity against a lepidopteran pest, wherein said protein comprises an amino acid sequence selected from the group consisting of SEQ ID NO:17 and SEQ ID NO:19.
3. The polynucleotide of claim 2 wherein said protein is a toxin obtainable from *Bacillus thuringiensis* isolate PS49C (NRRL B-21532) wherein said isolate comprises a gene that codes for said toxin, and said gene hybridizes with the nucleotide probe of SEQ ID NO:12 when said probe is used under conditions of 0.1% SDS and 1X SSPE at 65°C.
4. The polynucleotide of claim 2 wherein said protein is a toxin obtainable from *Bacillus thuringiensis* isolate PS158C2 (NRRL B-21532) wherein said isolate comprises a gene that codes for said toxin, and said gene hybridizes with the nucleotide probe SEQ ID NO:10 when said probe is used under conditions of 0.1% SDS and 1X SSPE at 65°C.
5. An isolated polynucleotide that encodes a protein that has toxin activity against a lepidopteran pest, wherein said polynucleotide comprises a nucleic acid sequence selected from the group consisting of SEQ ID NO:26, SEQ ID NO:16, and SEQ ID NO:18.
6. A method for controlling a lepidopteran pest wherein said method comprises administering to said pest a protein according to claim 1.
7. The method of claim 6 wherein said lepidopteran pest is a diamond back moth (*Plutella xylostella*).

8. The method of claim 7 wherein said diamond back moth is resistant to another *Bacillus thuringiensis* toxin.
9. The method of claim 7 wherein said protein is produced by and is present in a plant.
10. The method of claim 7 wherein said plant produces another *Bacillus thuringiensis* toxin.
11. The method of claims 9 wherein said plant is selected from the group consisting of cabbage, broccoli, collards, kale, cauliflower, and Brussels sprouts.
12. A method for controlling a diamond back moth pest wherein said method comprises administering to said pest a protein encoded by a polynucleotide according to claim 5.
13. The method of claim 12 wherein said diamond back moth is resistant to another *Bacillus thuringiensis* toxin.
14. The method of claim 12 wherein said protein is produced by and is present in a plant.
15. The method of claim 14 wherein said plant produces another *Bacillus thuringiensis* toxin.
16. The method of claims 14 wherein said plant is selected from the group consisting of cabbage, broccoli, collards, kale, cauliflower, and Brussels sprouts.
17. A method of screening a protein for toxin activity against a diamond back moth (*Plutella xylostella*) pest, wherein a polynucleotide that codes for said protein hybridizes with a nucleotide molecule selected from the group consisting of SEQ ID NO:26, SEQ ID NO:16, and SEQ ID NO:18.
18. The method of claim 17 wherein a plurality of proteins are screened for said activity.

19. A recombinant host selected from the group consisting of a plant cell, a microbial cell, and a plant, wherein said host comprises an isolated polynucleotide comprising a nucleotide sequence selected from the group consisting of SEQ ID NO:26, a nucleotide sequence that encodes SEQ ID NO:17, and a nucleotide sequence that encodes SEQ ID NO:19.
20. The host of claim 19 wherein said polynucleotide comprises SEQ ID NO:26.
21. The host of claim 19 wherein said nucleotide sequence is SEQ ID NO:16.
22. The host of claim 19 wherein said nucleotide sequence is SEQ ID NO:18.
23. The host of claim 19 wherein said host is a plant selected from the group consisting of cabbage, broccoli, collards, kale, cauliflower, and Brussels sprouts.
24. The host of claim 19 wherein said host is a plant cell of a seed.
25. The polynucleotide of claim 5 wherein said polynucleotide comprises the sequence of SEQ ID NO:26.
26. The method of claim 12 wherein said protein is used as part of a strategy to prevent or control the development of resistant diamond back moths.
27. A truncated or chimeric toxin comprising a segment consisting of residues 200 to the C terminus of a sequence selected from the group consisting of SEQ ID NO:17, SEQ ID NO:19, and SEQ ID NO:25.
28. The toxin of claim 27 wherein said segment comprises residues 191 to the C terminus of a sequence selected from the group consisting of SEQ ID NO:17, SEQ ID NO:19, and SEQ ID NO:25.

29. The toxin of claim 27 wherein said segment comprises residues 200 to 412 of a sequence selected from the group consisting of SEQ ID NO:17, SEQ ID NO:19, and SEQ ID NO:25.

30. The toxin of claim 29 wherein said segment comprises residues 200 to 455 of a sequence selected from the group consisting of SEQ ID NO:17, SEQ ID NO:19, and SEQ ID NO:25.

31. A chimeric toxin comprising a segment consisting of residues 412 to the C terminus of a sequence selected from the group consisting of SEQ ID NO:17, SEQ ID NO:19, and SEQ ID NO:25.